NOTES AND SPECIFICATIONS

GENERAL NOTES:

1. WORK INDICATED HEREIN IS RELATED TO INSTALLATION OF A NEW OR MODIFICATION OF AN EXISTING HELIPORT STRUCTURE. THE DESIGN PRESENTED IS BASED UPON AS MUCH INFORMATION AS WAS PROVIDED TO HELIPORT SYSTEMS. ASSUMPTIONS HAVE BEEN MADE BASED ON HELIPORT SYSTEMS' INTERPRETATION OF EXISTING SITE CONDITIONS AND THE ADAPTATION OF HELIPORT SYSTEMS' SPECIFIC MATERIALS AND INSTALLATION PROCEDURES TO THESE CONDITIONS. IF THE WORK INDICATED HEREIN IS PERFORMED BY SOMEONE OTHER THAN HELIPORT SYSTEMS OR WITHOUT THE DIRECT SUPERVISION OF A REPRESENTATIVE OF HELIPORT SYSTEMS, HELIPORT SYSTEMS WILL NOT BE RESPONSIBLE FOR ANY FAILURES, DAMAGE, INJURY, DELAY, LOSS OF INCOME, EXTRA COST, OR SIMILAR LOSSES.

2. ALL WORK SHALL CONFORM WITH APPLICABLE CODES AND REGULATIONS OF THE STATE OF PENNSYLVANIA AND WITH ALL LOCAL LAWS AND REGULATIONS. THE LATEST EDITION OF ALL CODES AND STANDARDS SHALL APPLY. SPECIFICALLY APPLICABLE STANDARDS:
A. IBC 2006
B. AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.
C. AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS. IN THE EVENT OF A CONFLICT BETWEEN APPLICABLE STANDARDS, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.

3. REFER TO SPECIFICATION SECTION 34 75 26 HELICOPTER LANDING SYSTEM FOR RELATED WORK.

4. MATERIALS INSTALLED IN THE WORK SHALL MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. NO SUBSTITUTIONS ALLOWED.

5. BEFORE SUBMITTING A BID FOR THE WORK TO BE DONE, CONTRACTORS AND FABRICATORS SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, AND LOCATIONS OF EXISTING STRUCTURES. NO ADDITIONAL PAYMENTS BEYOND THE CONTRACT PRICE WILL BE ISSUED FOR COMPLETION OF THE WORK IN ACCORDANCE WITH THE TERMS OF THE CONTRACT.

6. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, EQUIPMENT, AND SUPERVISION REQUIRED IN ACCORDANCE WITH THE TERMS OF THIS CONTRACT, INCLUDING ALL GENERAL AND DETAILED SPECIFICATIONS. THE WORK TO BE DONE UNDER ANY ITEM SHALL NOT BE LIMITED TO THE EXACT EXTENT OF THE WORK SHOWN OR DESCRIBED, BUT SHALL INCLUDE ALL INCIDENTAL WORK NECESSARY OR CUSTOMARILY DONE FOR THE COMPLETION OF THAT ITEM.

7. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORKS, UNUSED AND USELESS MATERIALS, RUBBISH, AND TEMPORARY BUILDINGS.

8. THE CONTRACTOR SHALL GUARANTEE HIS WORK TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE YEAR AFTER THE DATE OF COMPLETION.

9. THE CONTRACTOR SHALL PROVIDE SHORING AND BARRIERS AS REQUIRED TO PROTECT WORKMEN, MATERIALS, OTHER PROPERTIES, AND THE PUBLIC.

10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR THE CONSTRUCTION SEQUENCES AND PROCEDURES TO BE USED.

11. THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH CIVIL, ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL REQUIREMENTS INTO THE SHOP DRAWINGS AND CONSTRUCTION.

12. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL SAFETY ASPECTS OF THE WORK.

13. UNLESS BRACING AND SHORING IS SPECIFICALLY DETAILED ON THESE DRAWINGS, CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN ADEQUATE TEMPORARY SHORING, BRACING, AND OTHER SUPPORTS REQUIRED TO SAFELY EXECUTE THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR THE SAME.

14. BY THE ACT OF SUBMITTING A BID PROSPECTIVE FABRICATORS, ERECTORS, AND OTHER SUBCONTRACTORS WARRANT THE FOLLOWING:
A. THE BIDDER AND ALL PROSPECTIVE SUBCONTRACTORS HAVE CAREFULLY AND THOROUGHLY REVIEWED THE PROJECT DRAWINGS, SPECIFICATIONS, AND OTHER APPLICABLE CONSTRUCTION DOCUMENTS AND HAVE FOUND THEM TO BE COMPLETE, FREE FROM AMBIGUITY, AND ADEQUATE FOR THE COMPLETION OF THE WORK IN QUESTION WITHIN THE PROPOSED SCHEDULE.
B. THE BIDDER AND ALL PROSPECTIVE SUBCONTRACTORS HAVE CAREFULLY EXAMINED THE PROJECT SITE AND THAT SAID EXAMINATIONS HAVE FOUND EXISTING CONDITIONS BE SUBSTANTIALLY AS INDICATED IN THE CONTRACT DOCUMENTS WITH NO DISCREPANCIES SUBJECT TO NEGATIVELY IMPACT THE INSTALLATION OR TIMELY COMPLETION OF THE WORK IN QUESTION. THE BIDDER FURTHER WARRANTS THAT ADEQUATE ACCESS IS AVAILABLE FOR ALL REQUIRED EQUIPMENT INCLUDING GROUND BASED CRANES AND DELIVERY VEHICLES.
C. THE BIDDER AND ALL EMPLOYEES AND SUBCONTRACTORS TO PROPOSED FOR THE SUBJECT WORK ARE SKILLED AND EXPERIENCED IN THE APPLICABLE TYPE(S) OF CONSTRUCTION PRESENTED IN THE CONTRACT DOCUMENTS.
D. THE BIDDER AND ALL EMPLOYEES, AGENTS, SUPPLIERS, AND SUBCONTRACTORS HAVE NOT RELIED UPON ANY VERBAL REPRESENTATIONS, REGARDLESS OF ALLEGED AUTHORIZATIONS, FROM THE OWNER HIS EMPLOYEES OR AGENTS INCLUDING, ARCHITECTS, ENGINEERS, AND CONTRACTORS.
E. THE SUBMITTED BID IS BASED SOLELY UPON THE CONSTRUCTION CONTRACT DOCUMENTS AND PROPERLY ISSUED WRITTEN ADDENDA.

15. THE ENGINEER WILL REVIEW CONTRACTOR'S SHOP DRAWINGS AND RELATED SUBMITTAL WITH RESPECT TO CONFORMANCE WITH THE CONTRACT DOCUMENTS. PRIOR TO MAKING SUCH SUBMITTALS, THE CONTRACTOR SHALL REVIEW EACH SUCH SUBMISSION FOR COMPLETENESS CORRECTNESS AND CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, AND SEQUENCING OF CONSTRUCTION. CONTRACTOR SHALL ALSO REVIEW SUCH SUBMISSIONS IN REGARD TO SAFETY PRECAUTIONS AND PROGRAMS APPLICABLE TO THE WORK. RESPONSIBILITY FOR COORDINATING THESE REQUIREMENTS WITH EXISTING SITE DIMENSIONS AND CONDITIONS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. REVIEW OF SUBMITTALS FOR THE INFORMATION OUTLINED ABOVE SHALL BE INDICATED BY AN APPROPRIATE STAMP AND SIGNATURE AFFIXED TO THE SUBMITTAL. THE ENGINEER WILL ASSUME THAT NO SHOP DRAWING OR RELATED SUBMITTAL COMPRISES A VARIATION FROM THE CONTRACT UNLESS CONTRACTOR ADVISES THE ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY THE ENGINEER IN WRITING. IN THE EVENT THAT THE ENGINEER WILL REQUIRE MORE THAN TEN (10) WORKING DAYS TO PERFORM REVIEW, THE ENGINEER WILL SO NOTIFY THE CONTRACTOR.

DESIGN LOADS:

1. HELIPORT, TAXIWAY, AND PARKING PAD
A. ALUMINUM DECK DEAD LOAD: 12 PSF
B. UNIFORM LIVE LOAD: 100 PSF
C. HELICOPTER GROSS WEIGHT: 22,000 LBS
D. HARD LANDING IMPACT FACTOR: 1.50

DESIGN LOADS CONTINUED:

2. STAIRS
A. UNIFORM LIVE LOAD: 100 PSF

3. SAFETY NET
A. NET DEAD LOAD: 2 PSF
B. UNIFORM LIVE LOAD: 25 PSF OR 400 LBS CONCENTRATED LOAD

4. FUEL WATER SEPARATOR
A. SEPARATOR (FULL WT): 3,500 LBS
B. CONTAINMENT TANK (FULL WT): 2,500 LBS

STRUCTURAL STEEL NOTES:

1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE AISC SPECIFICATIONS FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, AND THE AISC CODE OF STANDARD PRACTICE, LATEST EDITIONS.

2. UNLESS SPECIFICALLY INDICATED OTHERWISE, ALL STEEL SHAPES SHALL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 992 GRADE 50 (MIN Fy = 50 KSI).

3. ALL STEEL PLATES AND ANGLES SHALL CONFORM TO THE EQUIREMENTS OF ASTM A 36.

4. ALL STEEL TUBES AND PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 500 GRADE B (MIN Fy = 46 KSI).

5. ALL STEEL SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A 123, WITH THE EXCEPTION OF STRUCTURAL PIPES, WHICH SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.

6. PROVIDE FINAL TOUCHUP OF HOT DIPPED GALVANIZED COATINGS, PARTICULARLY AREAS SUBJECT TO FIELD WELDING, WITH SPRAY APPLICATION OF ZINC-RICH PAINT.

7. UNLESS INDICATED OTHERWISE, ALL BOLTS SHALL BE ⅞"ø ASTM 325.

8. ALL BOLTED CONNECTIONS SHALL CONTAIN A MINIMUM OF TWO (2) BOLTS.

9. ALL BOLTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A 123.

10. UNLESS INDICATED OTHERWISE, ARC-WELDING ELECTRODES SHALL BE AWS 5.1 SERIES E70 FOR MANUAL ARC WELDING.

11. UNLESS INDICATED OTHERWISE, BOLT HOLES SHALL BE 1/16 INCH LARGER IN DIAMETER THAN THE INDICATED BOLT DIAMETER. BOLT HOLES IN GALVANIZED MEMBERS SHALL BE 1/8" LARGER IN DIAMETER THAN THE INDICATED BOLT DIAMETER.

12. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS AND SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE, AWS D1.1.

13. ALL WELDS SHALL BE UNIFORM IN SIZE AND APPEARANCE AND FREE FROM ALL PINHOLES, POROSITY, UNDERCUTTING, OR OTHER DEFECTS.

14. ALL COLUMNS SHALL BE MILLED TO BEAR AT CAP AND BASE PLATES.

15. DIMENSIONS SHOWN ARE TO CENTERLINES OF COLUMNS, BEAMS, AND PIPES; BACKS OF CHANNELS AND ANGLES; AND TOP SURFACES OF BEAMS AND TUBES, UNLESS INDICATED OTHERWISE.

17. ELEVATIONS SHOWN REFER TO TOP SURFACE OF MEMBER FLANGE OR CENTERLINE OF COLUMN UNLESS INDICATED OTHERWISE.

18. (–XX") FOLLOWING A FRAMING MEMBER DESIGNATION INDICATES TOP OF STEEL ELEVATION FOR THAT PARTICULAR MEMBER SHALL BE OFFSET A DISTANCE XX FROM TOP OF STEEL ELEVATIONS OF SURROUNDING FRAMING WITH "

S. PROVIDE MINIMUM SIZE IN ACCORDANCE WITH AWS D1.1. ALL WELDS SHALL DEVELOP FULL STRENGTH OF CONNECTED MEMBERS.

21. DRAWINGS MAY NOT DISTINGUISH BETWEEN SHOP AND FIELD WELDS. CONTRACTOR SHALL PROVIDE AS MUCH WELDING AS PRACTICAL IN THE SHOP.

ALUMINUM NOTES:

1. FABRICATION AND ERECTION OF STRUCTURAL ALUMINUM SHALL CONFORM TO THE LATEST EDITION OF THE ALUMINUM ASSOCIATION SPECIFICATIONS.

2. UNLESS INDICATED OTHERWISE, ALL ALUMINUM STRUCTURAL SHAPES SHALL CONFORM TO ASTM B 221 ALLOY 6061-T6.

3. ALUMINUM HELIPORT AND RAMP DECK SECTIONS SHALL CONFORM TO ASTM B 221 ALLOY 6005-T5.

4. ALUMINUM HELIPORT DECK SECTIONS SHALL HAVE THE FOLLOWING MINIMUM SECTION PROPERTIES:
D = 5.75 IN, A = 6.46 IN^2, I = 33.65 IN^4, S = 10.06 IN^3.

5. ALUMINUM RAMP DECK SECTIONS SHALL HAVE THE FOLLOWING MINIMUM SECTION PROPERTIES: D = 2.25 IN, A = 2.06 IN^2, I = 1.35 IN^4, S = 0.90 IN^3.

6. ALL WELDING SHALL BE CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE – ALUMINUM, AWS D1.2.

7. ALUMINUM MEMBERS SHALL BE PREVENTED FROM BEARING DIRECTLY ON STEEL SURFACES BY PLACING A CONTINUOUS NEOPRENE SHEET BETWEEN THE TWO MATERIALS.

SAFETY NET NOTES:

1. SAFETY NET FABRIC SHALL CONSIST OF 9 GA 1 1/4" WEAVE GALVANIZED CHAIN LINK FENCE.

2. SECURE CHAIN LINK FENCE FABRIC TO ALUMINUM ANGLE FRAME WITH ALUMINUM CLIPS AND POWDER ACTUATED STAINLESS STEEL FASTENERS SPACED AT 24" ON-CENTER MAXIMUM.

COLUMN SCHEDULE

COLUMN DESIGNATION	TOP OF COL ELEVATION (FT.)	VERT. LOAD	LAT LOAD	COL. SIZE	CAP PLATE	ISO LOAD
3.1–B/9**	1215.36	7	BRACED (BY OTHERS)	BY OTHERS	4"x4"x1" MIN. BY OTHERS	NA
3.1–C**	1215.74	10	BRACED (BY OTHERS)	BY OTHERS	4"x4"x1" MIN. BY OTHERS	NA
3.4a–B/9**	1215.36	7	BRACED (BY OTHERS)	BY OTHERS	4"x4"x1" MIN. BY OTHERS	NA
3.4a–C**	1215.74	10	BRACED (BY OTHERS)	BY OTHERS	4"x4"x1" MIN. BY OTHERS	NA
3.1–100	1214.86	10	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
3.4a–100	1214.86	10	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
3.1–B	1215.37	12	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
3.4a–B	1215.37	12	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
3.1–A.2	1216.76	12	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
3.1–A.1	1216.76	5	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
3.4a–A.2	1216.76	20	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
3.4a–A.1	1216.76	15	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
5–A.2	1219.26	22	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
5–A.1	1219.26	22	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
6–A.2	1220.77	17	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
6–A.1	1220.77	17	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
7–A.2	1222.11	17	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
7–A.1	1222.11	17	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
8–A.2	1223.88	14	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
8–A.1	1223.88	14	BRACED (BY OTHERS)	BY OTHERS	7"x12"x1"	NA
8–A	1222.53	41	3	BY OTHERS	19"x19"x1"	28
9–A	1222.31	45	3	BY OTHERS	19"x19"x1"	30
10–A	1222.09	45	3	BY OTHERS	19"x19"x1"	30
11–A	1221.87	42	3	BY OTHERS	19"x19"x1"	28
8–B	1222.53	41	3	BY OTHERS	19"x19"x1"	26
9–B	1222.31	41	3	BY OTHERS	19"x19"x1"	26
10–B	1222.09	41	3	BY OTHERS	19"x19"x1"	26
11–B	1221.87	41	3	BY OTHERS	19"x19"x1"	26
8–C	1222.53	43	3	BY OTHERS	19"x19"x1"	28
9–C	1222.31	54	3	BY OTHERS	19"x19"x1"	31
11–C	1221.87	43	3	BY OTHERS	19"x19"x1"	30
10–C	1222.09	54	3	BY OTHERS	19"x19"x1"	30
ST	SEE PLAN AND SECTION	3	BRACED (BY OTHERS)	HSS4x4 BY OTHERS	4x4	NA

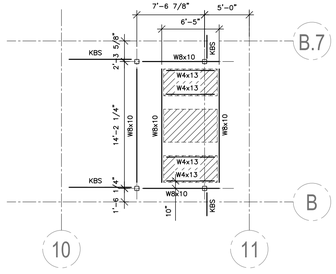
COLUMN SCHEDULE NOTES

1. COLUMNS INCLUDE CAP PLATES, BASE PLATES, FASTENERS TO BUILDING, AND VERIFICATION OF STRENGTH OF BUILDING TO SUPPORT LOADS SHOWN IN THE SCHEDULE.
2. ELEVATION DENOTES TOP OF COLUMN CAP PLATE AT CENTERLINE OF COLUMN. ALL COLUMN CAP PLATES SHALL BE FABRICATED TO MATCH SLOPE OF SUPPORTED FRAMING UNLESS INDICATED OTHERWISE.
3. COLUMN DESIGN LOADS ARE MAXIMUM SERVICE LOADS APPLIED AT TOP OF COLUMN CAP PLATE AND ARE POSITIVE IN THE DOWNWARD DIRECTION. COLUMN DESIGN LOADS INCLUDE DEAD WEIGHT OF ALL STRUCTURAL ELEMENTS AND MAXIMUM APPLICABLE LIVE LOADS, INCLUDING HELIPORT HELICOPTER LOAD.
4. COLUMNS, CAP PLATES, BASE PLATES, ATTACHMENT TO BUILDING BY GENERAL CONTRACTOR. BUILDING ENGINEER TO VERIFY COLUMN DESIGN ADEQUATE FOR SHOWN LOADINGS.
5. COLUMNS TO BE DESIGNED FOR OR BRACED FOR LATERAL LOADS SHOWN IN ANY DIRECTION.

6.**–COLUMNS ARE OFFSET FROM COL LINE. SEE PLAN AND SECTION. CAP PLATE SIZES AND BOLT HOLES TO BE COORDINATED WITH EOR.

VIBRATION ISOLATOR NOTES

1. VIBRATION ISOLATORS TO BE PROVIDED BY HELIPORT SYSTEMS.
2. VIBRATION ISOLATORS TO BE DESIGNED TO DAMP VIBRATIONS TO OWNERS REQUIREMENTS FROM "ISOLATOR DYNAMIC LOAD" AS SHOWN ON COLUMN SCHEDULE. VIBRATION ISOLATOR LOAD IS DEAD LOAD AT COLUMN PLUS GROSS WEIGHT OF HELICOPTER.
3. VIBRATION ISOLATOR TO BE CAPABLE OF STATICALLY RESISTING FULL COLUMN DESIGN LOAD VERTICALLY.
4. VIBRATION ISOLATORS TO BE SUITABLE FOR PERMANENT EXTERIOR EXPOSURE.
5. VIBRATION ISOLATORS TO BE 18"x18"x2" DEEP "FABCELL" BY FABREEKA. ISOLATOR MANUFACTURER/PROVIDER TO COORDINATE ISOLATOR BOLT SIZES AND PATTERNS WITH DETAILS SHOWN ON THIS PLAN. ISOLATOR MANUFACTURER TO PROVIDE VIBRATION ISOLATING BUSHINGS FOR BOLTS.
6. ISOLATOR MANUFACTURER TO PROVIDE ASSEMBLY DRAWINGS, DESIGN CALCULATIONS, INSTALLATION INSTRUCTIONS, AND SPECIFICATIONS. ISOLATORS TO BE INSTALLED IN STRICT ACCORDANCE WITH ALL MANUFACTURERS SUBMISSIONS.

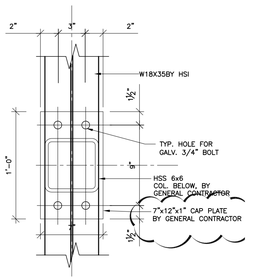


SEPARATOR FRAMING PLAN

SCALE: 1/8" = 1'–0"

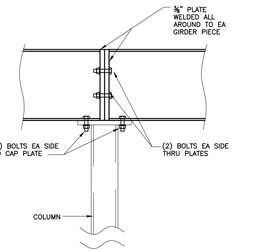
SEP. FRAMING PLAN GENERAL NOTES:

1. BOT OF STEEL TO BE MIN 1'–0" ABOVE FINISHED ROOF. COORD. w/MECH PLAN, AND ROOF ELEVATIONS.
2. W4x13 TO BE AT –3½" FROM W8x10.
3. HANGERS TO BE HSS3x3x⅜" w/⅜" PLATE SHOP FAB T&B. (4) BOLT CONNECTION TO FRAMING T&B.
4. "KBS"=L4x4x⅜" BRACE@45°± UP TO HELIPORT FRAMING. ATT. w/⅜" PLATES T&B.



WALKWAY COLUMN DETAIL

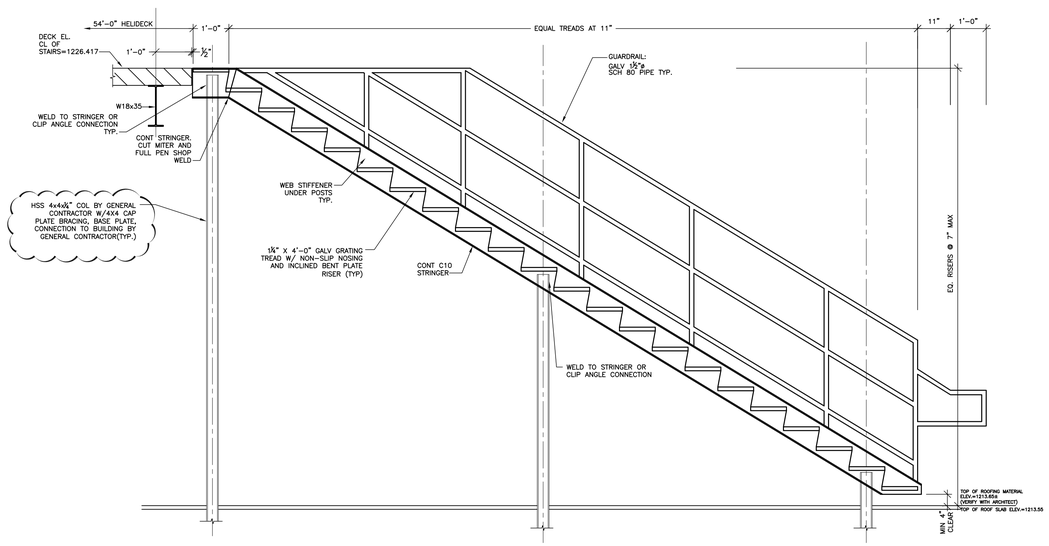
SCALE: 1–1/2"=1'–0"



NOTE:– SEE PLAN FOR LOCATIONS

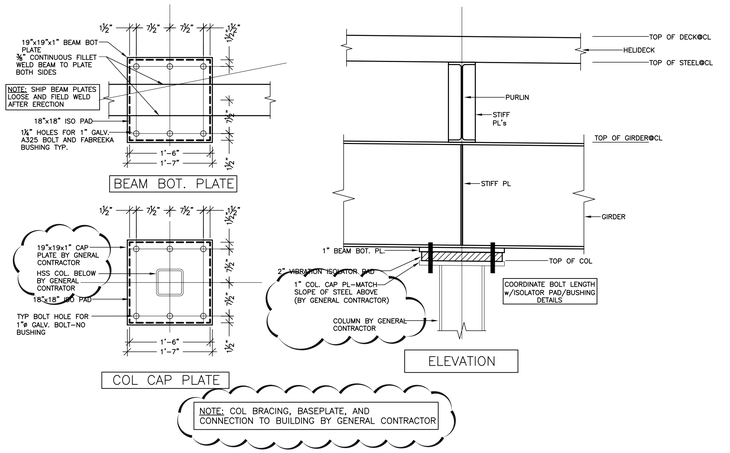
GIRDER/BEAM SPLICE DETAIL

SCALE: 3/4" = 1'–0"



SECTION ST–1

SCALE: 1/2" = 1'–0"



HELIPAD COLUMN DETAILS

SCALE: 3/4"=1'–0"

PRELIMINARY
NOT FOR
CONSTRUCTION

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NEW ROOFTOP HELIPORT
FOR
VA MEDICAL CENTER
Pittsburgh, PA

REVISIONS:
24 AUG 2009
01 SEPT 2009
26 MAR 2010
20 MAY 2010

DRAWN: IDS/JGD

SHEET NO.
HP-S-4